



LUBA Repair SOP

v1.0

2023.12



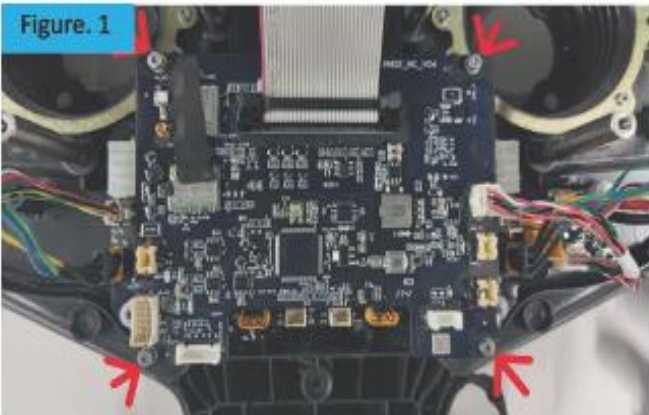
File name	Left/right shell protector replacement					★ ★
Level	L1	Version	1.0	page	?	
Repair name	Replace the left/right shell protector					
Process	Repair steps					
Product inspection	1.Disassemble the top cover and remove the 2 screws（M4.2*10 H3 F.100.SZ0505）on the left side, then you can take apart the left shell protector and replace it 2.Remove the 2 screws（M4.2*10 H3 F.100.SZ0505）as the Figure2, you can take apart the right shell protector and replace it					
→remove the top cover						
→remove the left/right shell protector						
→replace the left/right shell protector						
→assemble the top cover						
Note:						
1.Electric batch torque: (10±1)kgf.cm	2	C.700.0254	Right Lower Shell Guard		1	
	1	C.700.0253	Left Lower Shell Guard		1	
	No.	Part Code	Part Name	Description	Qty	

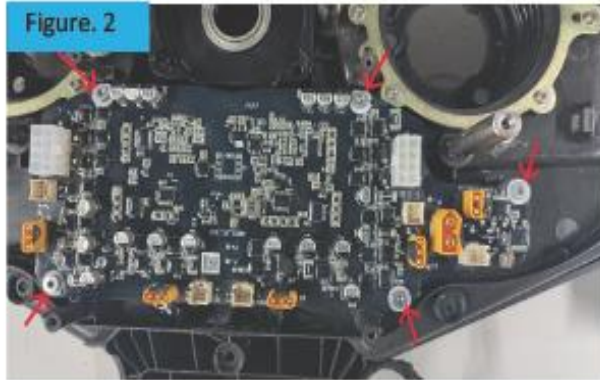
图 1

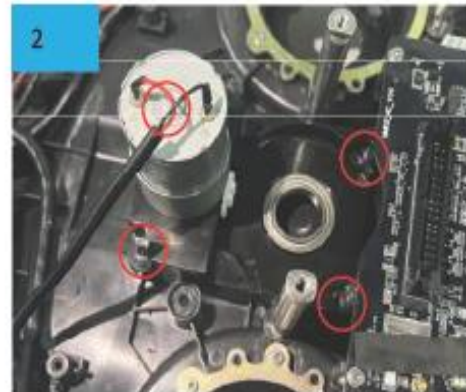


图 2

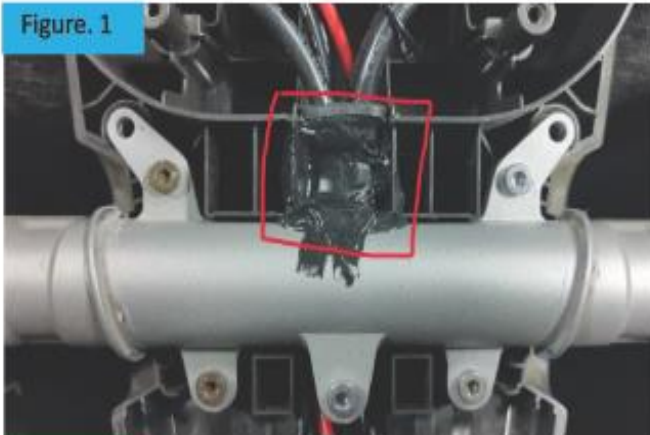


File Name	Disassemble Mainboard					★Confidential★
Level	L1	Version number	1.0	Page	2	
Operation	Take down 4 screws					Figure. 1 
Procedures	Steps					
Disconnect power connection ↓ Disconnect other cables ↓ Take down screws ↓ Take out mainboard ↓ Install new one ↓ Re-connect cables	1. Take down 4 pcs self-tapping screw around mainboard; 2. Take out and replace with new board;					
	Precautions					
1. Electric batch torque: (10±1)kgf.cm						
2. Screwdriver head: H2;						
3. You have to test all function after you replaced new board.						
1	W.Z.PA.000168050	HM02_PCBA_MCU Mainboard			1	
2	F.100.SZ0506	Hexagon self-tapping screw	M3*8 *5.2*2		4	
No.	Material code	Material	Item Description		Usage	

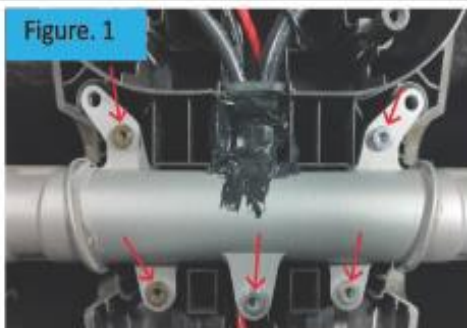
File Name	Disassemble Drive Board					★Confidential★			
Level	L1	Version number	1.0	Page					
Operation	Disconnect all cable connection								
Procedures	Steps								
Disconnect all connection ↓ Take down screws ↓ Replacement	1. Disconnect all connection includes hub motor, cutting motor; 2. Take down 5pcs self-tapping screws; 3. Replace new drive board;								
	Figure. 1  Figure. 2 								
Precautions									
1. Electric batch torque: (10±1)kgf.cm 2. Screwdriver head: H3; 3. You have to test all function after you replaced new board.					1	F.100.SZ0505	Hexagon self-tapping screw	M4.2*10*7.5*3	5
					2	W.Z.PA.000169030	HM02_PCBA_Drive Board		1
					No.	Material code	Material	Item Description	Usage

File name	Replace the lifting structure and lifting motor					★ Confidential ★
Level	L2	Version number	1.0	Page	?	
Repair name	Replace the lifting structure and lifting motor					
Process	Repair steps					
product inspection ↓ Remove the shell ↓ Remove lifting bracket ↓ Replace lifting gear and motor ↓ Replace cutting motor ↓ Close shell ↓ Outdoor detection ↓ Pack and send out	1. Use an H10 nut wrench and a caliper to remove the M10 nut from the chuck. (1) 2. Remove the chuck. (2) 3. Remove the 8 screws on the lift motor. (M4*8 H2.5 F.100.SZ0515) (3) 4. Take out the lift motor. When replacing the lift motor, you need to remove the thermal cotton and re-attach it. The small thermal cotton is glued to the front of the motor, and the large thermal cotton is glued to the back of the motor. (4) 5. Reinstall in the original order.					
Precautions						
1. Electric batch torque: (10 ± 1) kgf.cm						
图 1 					1 	
2 					2 	
Number					Material code	Material
					Item Description	Dosage

File Name	Disassemble Rear Axle					★Confidential★
Level	L2	Version number	1.0	Page	1	
Operation	Unbind cable tie & take down battery					Figure. 1  Figure. 2 
Procedures	Steps					
Unbind cable tie ↓ Take out battery ↓ Clean sealant ↓ Take down mounting screws ↓ Pull out hub motor ↓ Replace rear axle ↓ Re-gluing	1. Unbind cable tie by clipper or diagonal pliers. 2. Take down 4 pcs self-tapping screws around battery then you may take it out; 3.					
Precautions						
1. Electric batch torque: (10±1)kgf.cm; 2. Screwdriver head: H3;						
1	F.100.SZ0504	Hexagon self-tapping screw	M4.2*16 * 7.5*3	4		
2	W.D.BT.000003000	Lithium Battery	21.6V 9.6Ah 6S4P HM02	1		
No.	Material code	Material	Item Description	Usage		

File Name	Disassemble Rear Axle					★Confidential★
Level	L2	Version number	1.0	Page	2	
Operation	Clean sealant	Figure. 1  Figure. 2 				
Procedures	Steps					
Unbind cable tie ↓ Take out battery ↓ Clean sealant ↓ Take down mounting screws ↓ Pull out hub motor ↓ Replace rear axle ↓ Re-gluing	1. Use a spatula to clean sealant;					
	Precautions					
	1. Do not damage cables;	1	W.D.BT.000003000	Lithium Battery	21.6V 9.6Ah	1
		2	K.020.SZ0006	Rear Axle / AlSi10MnMg	228*69*63.6mm	1
		No.	Material code	Material	Item Description	Usage

File Name	Disassemble Rear hub motor					★Confidential★
Level	L2	Version number	1.0	Page	3	
Operation	Take down 5 screws & Pull out hub motor					
Procedures	Steps					
Unbind cable tie ↓ Take out battery ↓ Clean sealant ↓ Take down mounting screws ↓ Pull out hub motor ↓ Replace rear axle ↓ Re-gluing	1. Take 5 pcs mounting self-tapping screws. 2. Disconnect cable connection from mainboard and drive board, and then pull out these cables from small hole; 3. Take down 4 pcs mounting machine screws that blocks the hub motor; 4. Pull out connection cable of hub motor;					
	Precautions					
	1. Electric batch torque: $(10 \pm 1)\text{kgf.cm}$;	1	F.100.SZ0504	Hexagon self-tapping screw	M4.2*16 * 7.5*3	5
	2. Screwdriver head: H3/H2;	2.	F.100.SZ0514	Hexagon machine screw	M3*12	4
	3. To aim the pressing block at rotation shaft of hub motor.	No.	Material code	Material	Item Description	Usage
	4. After you replaced new rear axle, you have to re-gluing sealant and dry itself for 20 minutes at least.					



File name		Luba replacement vision module				★ Confidential ★
Level	L1	Version number	1.0	Page	?	
Repair name		Replace Vision Module				
Process		Repair steps				
product inspection ↓ Replace vision module ↓ Outdoor detection ↓ Pack and send out		1  2 				
		Precautions				
		1. Electric batch torque: (5±1)kgf.cm				
		1	P.035.SZ0003	Visual components	Visual components	1
		Number	Material code	Material	Item Description	Dosage

File Name	Disassemble Rear Hub Motor					★Confidential★
Level	L2	Version number	1.0	Page		
Operation	Disassemble hub motor					Figure. 1  Figure. 2  Figure. 3 
Procedures	Steps					
Take down mounting screws Take out hub motor replacement Assemble hub motor	1. Take down 6 pcs machine screws; 2. Take out wheel; 3. Replace with new hub motor.					
	Precautions					
1. Electric batch torque: (10±1)kgf.cm; 2. Screwdriver head: H2.5;		1	F.100.SZ1319	Hexagon machine screw	M4*26*6.6mm	6
		2.	D.015.SZ0015	Drive motor	24VDC 80W Long-cable	1
		No.	Material code	Material	Item Description	Usage

File name	Front axle replacement					★ ★
Level	L1	Version	1.0	page	?	
Repair name	Replace the Front Axle					
Process	Repair steps					
Product inspection	1. Disassemble the top cover and PCB board, then use the scissors to remove the waterproof glue as the Figure1 to pull out the cables 2. Remove the 7 screws (M4.2*10 H3 F.100.SZ0505, M4.2*16 H3 F.100.SZ0504, M5*14 H4 F.100.SZ0518) as the Figure2 to release the left/right rubber seals and the cube metal frame. 3. Remove the 2 screws (M8*28 H6 C.700.0257) as the Figure3, then you can take apart the front axle with wheels. 4. Remove the 12 screws (M3*12 H2 F.100.SZ0514, M2*6 H1.5 F.100.SZ0511) as the Figure4 to take apart the left/right wheels from the axle. 5. Remove the 4 screws (M3*10 H2.5 F.100.SZ1369) as the Figure5 to take apart the fisheye rod and robber seal. 6. Inject the waterproof glue as the Figure6					
→ remove the top cover						
→ remove the glue						
→ remove the front axle						
→ replace the front axle						
→ inject the waterproof glue						
→ reassemble						
→ outdoor test						
Note:						
1. Electric batch torque: (10±1)kgf.c	2					1
	1	C.700.0490	Front Axle			1
	No.	Part Code	Part Name	Description		Qty

图1

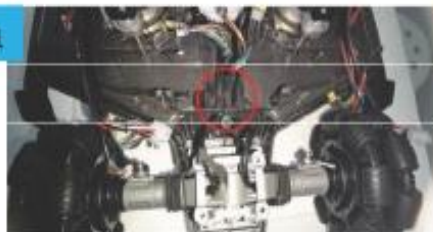


图2



图3



图4



图5



图6



File name	The front Hub motor replacement					★ ★
Level	L1	version	1.0	页次	?	
Repair name	Replace the front hub motor					
Process	Repair steps					
Product inspection → remove the top cover → remove the mainboard → remove the driver board → remove the waterproof glue → remove the front axle → Remove the wheel → remove and replace the hub motor → reassemble → outdoor test	1. Remove the 6 screws(M4*18 H2.5 F.100.SZ1318) as the Figure1 2. Pull out the hub motor from the wheel as the Figure2					
Note:						
1.Electric batch torque: (10±1)kgf.cm 2.Aim at the arrow mark on the motor and the tires as the Figure3, you can easily install the tires.						
		2				
		1	D.015.SZ0014	Wheel motor (front)	1	
		No.	Part Code	Part Name	Qty	

Figure1



Figure2



Figure3



File name	Tires replacement					★ ★
Level	L1	Version	1.0	page	?	
Repair Name	Replace the tires					
process	Repair steps					
Product inspection	→ remove the front/rear tires → remove the white circle trim → replace the tires → install the tires					
	1. Turn over the Luba and remove the 12 screws outside the wheels (front wheel M4*18 H2.5 F.100.SZ1318, rear wheel M4*26 H2.5 F.100.SZ1318) as the Figure1, then you can pull out the tires from the motor. 2. Use the flat screwdriver to take apart the white circle trim as the Figure2 and replace the tires					
	Note:					
	1. Electric batch torque: (10±1)kgf.cm 2. Aim at the arrow mark on the motor and the tires as the Figure3, you can easily install the tires.					
	2	C.700.0484 C.700.0479	Outer Shell Wheel(omni) Inner Shell Wheel(omni)			1
	1	C.700.0234 C.700.0235	Left tire Right tire			1
	No.	Part Code	Part Name	Description		Qty

Figure1

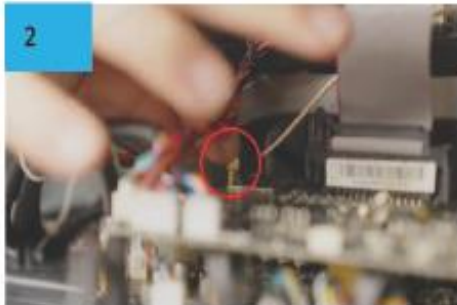


Figure2

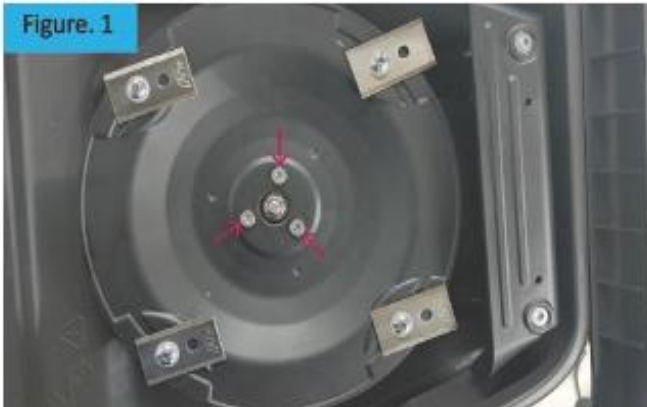


Figure3



File name		General process				★ Confidential★
Level	Common process	Version number	1.0	Page	?	
Repair name		Assemble the Top Cover				
Process		Repair steps				
Remove the shell		1  2  2  3 				
Replace the cutting plates						
Replace the cutting plates						
Close the shell		4  4  4  4  4  4 				
Precautions		1. The waterproof strip is easy to fall out and needs to be completely inserted back.				
Number		Material code		Material		Item Description
						Dosage

File Name	Disassemble Cutting Blades					★Confidential★
Level	L1	Version number	1.0	Page		
Operation	Disassemble Cutting Blades					
Procedures	Steps					
Lift Luba on its side ↓ Hold on its cutting disk ↓ Take down screws ↓ Install new cutting blades	1. Lift Luba on its side; 2. Hold on its cutting disk; 3. Take down the Phillips machine screws, then replace with new one.					
	Figure. 1 					
	Figure. 2 					
	Precautions					
	1. Electric batch torque: (10±1)kgf.cm 2. Do not advise you to use electric screwdriver to take down screws in case of hand injury. 3. Screwdriver head: Phillips;					
1	C.700.0505	Cutting blades		1		
2	F.100.SZ1314	Blade mounting screw	M4x8mm, Phillips	4		
No.	Material code	Material	Item Description	Usage		

File Name	Disassemble Cutting Disk					★Confidential★
Level	L1	Version number	1.0	Page		
Operation	Disassemble Cutting Disk					
Procedures	Steps					
Lift Luba on its side ↓ Hold on its cutting disk ↓ Take down screws ↓ Install new cutting disk	1. Lift Luba on its side; 2. Hold on its cutting disk; 3. Take down 3pcs machine Screw from 'cutting motor adapter bracket'.					
	Figure. 1 					
	Figure. 2 					
	Precautions					
1. Electric batch torque: (10±1)kgf.cm 2. Do not advise you to use electric screwdriver to take down screws in case of hand injury. 3. Screwdriver head: H2.5;						
		1	W.S.SJ.000014000	Cutting disk		1
		2	F.100.SZ0504	Hexagon machine screw	M4.2*16 * 7.5*3	3
		No.	Material code	Material	Item Description	Usage

File name	General process					★ Confidential ★
Level	Common process	Version number	1.0	Page	?	
Repair name	Remove the Top Cover					
Process	Repair steps					
Remove the shell	1. Gently lift the upper shell, and you can see that there are cables connecting the upper case and the mainboard. Lift the upper shell 10cm from the left side. (1) 2. Unplug the RTK module connection cables and cable interface. (2 3) 3. Completely remove the upper shell. (4)					
Replace the cutting plates						
Replace the cutting plates						
Close the shell						
Precautions	1. Do not lift the upper shell more than 10cm from the side, and do not break the wires. 2. If you remove all the screws according to the instructions, the upper shell can be easily lifted, and there are no buckles in it. 3. To remove the RTK yellow connector, you need to pull it out vertically. 4. Electric batch torque: $(10 \pm 1)\text{kgf.cm}$					
	Number	Material code	Material	Item Description	Dosage	



File name	Luba battery replacement				★ Confidential ★
Level	L1	Version number	1.0	Page	
Repair name	Replace battery				
Process	Repair steps				
product inspection Remove the shell Remove old battery Install new battery Close the shell Outdoor detection Pack and send out	1. Disconnect the battery from the yellow terminal on the mainboard. (1)				
	2. Remove the 4 screws locking the battery. (M4.2*16 H3 F.100.SZ0504) (2)				
	3. Remove the old battery.				
1  2 					
Precautions					
1. A popping sound may occur when removing or connecting battery terminals. This phenomenon is normal and is not harmful.					
2. Note that 4.5ah batteries are suitable for Luba 1000 and 9.6ah batteries are suitable for Luba3000/5000.					
2. Electric batch torque: (10±1)kgf.cm					
2	WDBT.000002000	lithium battery	21.6V 4.5Ah (Applicable to model luba1000)	1	
1	WDBT.000003000	lithium battery	21.6V 9.6Ah (Applicable to model luba3000/5000)	1	
Number	Material code	Material	Item Description	Dosage	

File name	Luba battery replacement					★ Confidential ★
Level	L1	Version number	1.0	Page	?	
Repair name	Replace battery					
Process	Repair steps					
product inspection ↓ Remove the shell ↓ Remove old battery ↓ Install new battery ↓ Close the shell ↓ Outdoor detection ↓ Pack and send out	1. Install new batteries. 2. Tighten the 4 screws that lock the battery. (M4.2*16 H3 F.100.SZ0504) (1) 3. Connect the battery to the yellow terminal on the mainboard. (2) 4. Apply additional terminal interface sealant.					
	Precautions 1. A popping sound may occur when removing or connecting battery terminals. This phenomenon is normal and is not harmful. 2. Note that 4.5ah batteries are suitable for Luba 1000 and 9.6ah batteries are suitable for Luba3000/5000. 3. Electric batch torque: (10±1)kgf.cm					
	2	WDBT.000002000	lithium battery	21.6V 4.5Ah (Applicable to model luba1000)	1	
	1	WDBT.000003000	lithium battery	21.6V 9.6Ah (Applicable to model luba3000/5000)	1	
Number		Material code	Material	Item Description	Dosage	



File name	Grass Comb replacement					★ ★
Level	L1	Version	1.0	page	?	
Repair steps	Replace the Grass Comb					
Process	Repair steps					
Product inspection → remove and replace the front/rear grass comb → remove the left/right blade disk → remove and replace the left/right grass comb	Figure1  Figure2  Figure3 					
Note:						
1. Electric batch torque: (10±1)kgf.cm	2	C.200.0003	Left grass comb		1	
2.	1	C.200.0004	Right grass comb		1	
	No.	Part Code	Part Name	Description	Qty	